

SITE 16 : Heath Clark, Stafford Road

1) PROPOSED DEVELOPMENT

Site ID	16
Site Address	Heath Clark, Stafford Road
Site Area	3.56 ha
Current Use	Field
Allocated Use	Secondary School and residential development subject to access from Stafford Road
Vulnerability	More Vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

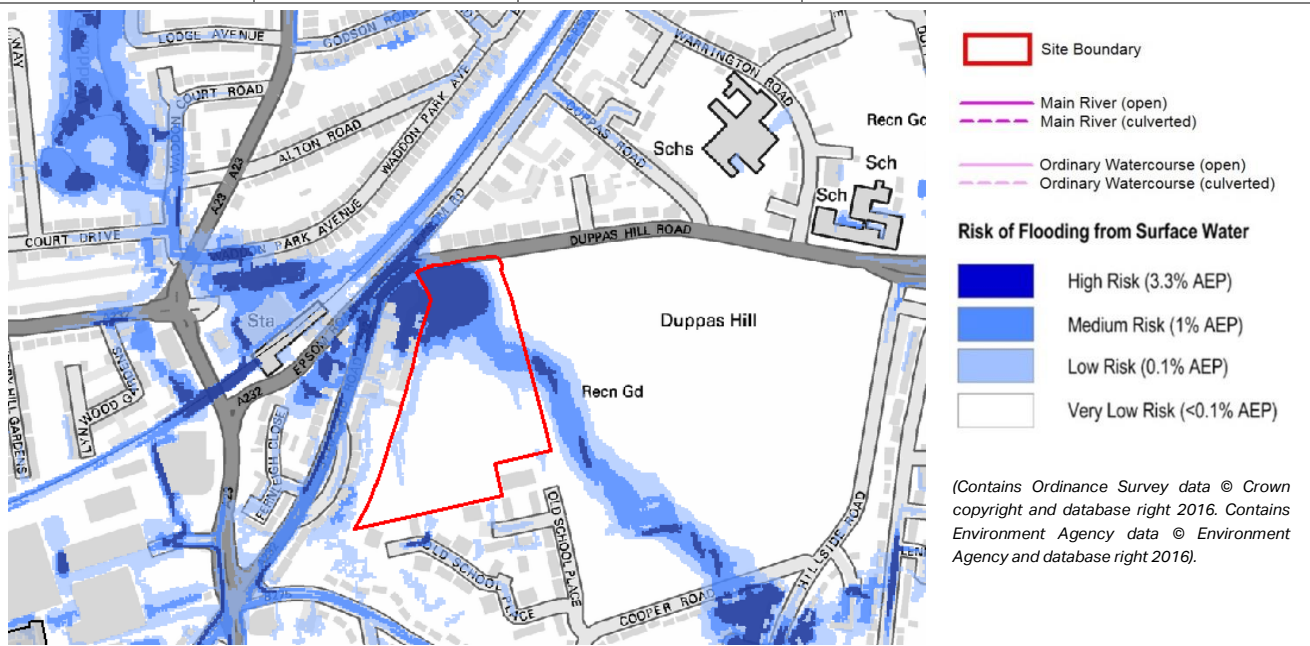
Flood risk from rivers

The site is located approximately 600m south-east of River Wandle and lies in Flood Zone 1, low probability of flooding from rivers.

Flood risk from all other sources

Limitations

<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	High Risk 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	



Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	1	0	0	0	0

SITE 16 : Heath Clark, Stafford Road

3) RECOMMENDATIONS

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The following information and recommendations are therefore provided for consideration.

Development Layout and Sequential Approach	<p>The uFMfSW shows a significant area of surface water ponding in the northern part of the site. An detailed assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. School buildings and residential buildings should be located in areas of very low surface water flood risk.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level. Further ground investigations would be required at this site to confirm the the likelihood of groundwater occurrence.</p>	Section 9.2
Finished Floor Levels	<p>Although the majority of the site is within Flood Zone 1, it is good practice to set finished floor levels a minimum of 300mm above ground level in order to reduce the risk of flooding from surface water, which is at high risk in this area. It is recommended that consideration is given to the flow of surface water during the development of the site masterplan and layout to ensure effective management of surface water flows.</p>	
Flood Resistance	<p>Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater to reduce the risk of floodwater entering properties.</p>	Section 9.4
Flood Resilience	<p>Where parts of proposed buildings may be affected by surface water floodwaters, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.</p>	Section 9.5
Flow Routing	<p>Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.</p>	Section 9.12
Surface Water Management	<p>Current risk of flooding</p> <p>The site does not fall within a Critical Drainage Area (CDA), however the northern site boundary is adjacent CDA – Group 8_042, which is an area with localised flooding issues. The potential development must not increase flood risk to areas within the CDA. The site is within Drainage Catchment 37, which is located at the west part of the borough.</p> <p>The uFMfSW indicates that the site lies within an area of high risk of surface water flooding, particularly at its northern part, and the surrounding areas are at high to medium risk of surface water flooding. There is one historic record of surface water flooding held by Croydon Council in this location.</p> <p>Indicative existing runoff rate: 18.7 l/s (1 in 1 year), 70.4 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 7.1 l/s</p> <p>SuDS Suitability</p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially suitable. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p>Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems.</p>	Level 2 Appendix B Section 10.3 and 10.9

SITE 16 : Heath Clark, Stafford Road

	<p>Drainage Strategy and Approvals</p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13, the Mayor's Design and Construction SPG (2014) and Croydon's Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p>Indicative Unit Costs</p> <p>Green roofs ~ £90/m². Filter strips £2-4m². Detention basin £15-50m³. Permeable paving ~ £30-50/m². Concrete storage tank £449-518/m³.</p>	Section 10.4

SITE 25 : Morrisons Supermarket, 500 Purley Way

1) PROPOSED DEVELOPMENT

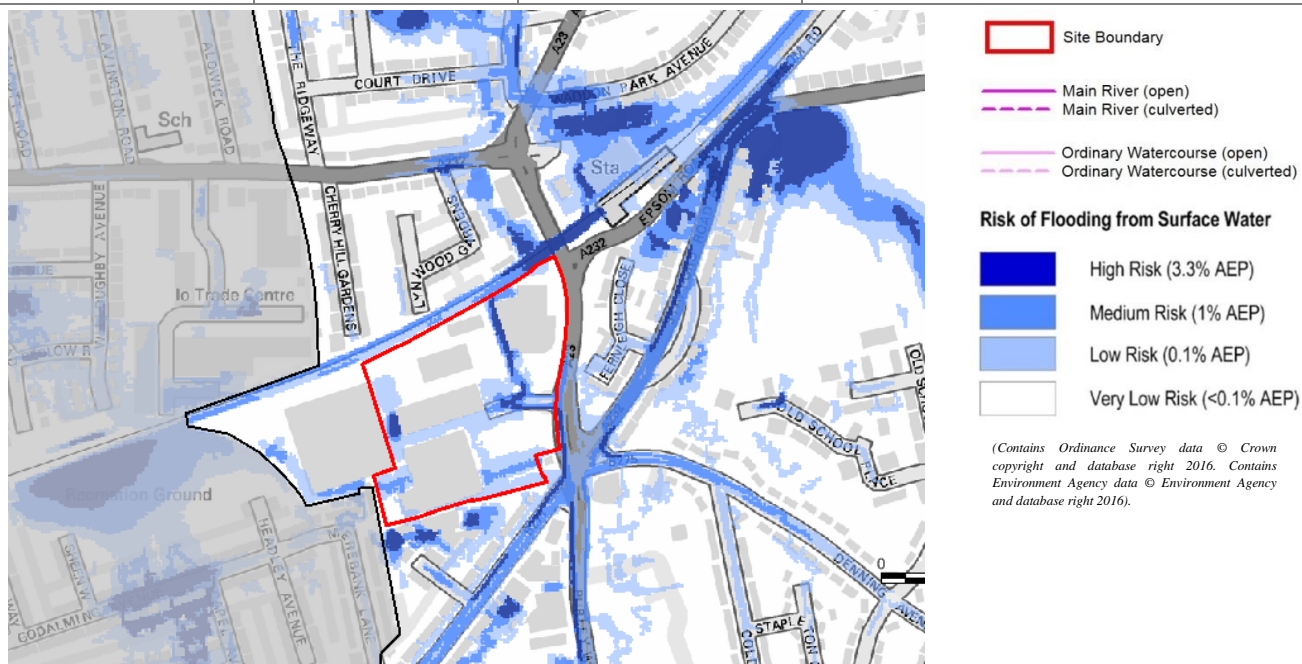
Site ID	25
Site Address	Morrisons Supermarket, 500 Purley Way
Site Area	3.75 ha
Current Use	Retail warehouse site bordering Purley Way and Stafford Road
Allocated Use	Redevelopment of a mix of residential, retail, commercial and community uses to form the basis of a new residential community
Vulnerability	More Vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The River Wandle, a designated main river, is located approximately 550m north of the site. The site lies within Flood Zone 1, low probability of flooding from rivers.

Flood risk from all other sources		Limitations	
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	High Risk 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	1	0	0	0	0

SITE 25 : Morrisons Supermarket, 500 Purley Way**3) RECOMMENDATIONS**

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The following information and recommendations are therefore provided for consideration.

Development Layout and Sequential Approach	<p>The uFMfSW shows areas at high risk of surface water flooding along roads and low lying areas, however the majority of the site is at low or very low risk. An assessment of surface water flow paths should be made during the development of the site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. The More Vulnerable aspects of the development (residential) should be located in areas of lower surface water flood risk.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level. Further ground investigations would be required at this site to confirm the the likelihood of groundwater occurrence.</p>	Section 9.2
Flood Resistance	<p>Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater to reduce the risk of floodwater entering properties.</p>	Section 9.4
Flood Resilience	<p>Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.</p>	Section 9.5
Flow Routing	<p>Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.</p>	Section 9.12
Surface Water Management	<p>Current risk of flooding</p> <p>The site is within Drainage Catchment 37, which is located at the west part of the borough. The potential development must not increase flood risk to other areas in the Drainage Catchment.</p> <p>The uFMfSW identifies a pathway of high risk along the road in the north east of the site. There is one historic record of surface water flooding held by Croydon Council in this location.</p>	
	<p>Indicative existing runoff rate: 19.7 l/s (1 in 1 year), 74.0l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 7.5 l/s</p>	Level 2 Appendix B
	<p>SuDS Suitability</p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially suitable. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p>Techniques which should be considered including soakaways and infiltration SUDS supplemented by green roofs, filter strips, detention basins and ponds, as well as permeable surfacing. Infiltration rates should be confirmed on site prior to confirming the drainage strategy.</p>	Section 10.3 and 10.9

SITE 25 : Morrisons Supermarket, 500 Purley Way

	<p>Drainage Strategy and Approvals</p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p>Indicative Unit Costs</p> <p>Green roofs ~ £90/m².</p> <p>Filter strips £2-4m².</p> <p>Detention basin £15-50m³.</p> <p>Permeable paving ~ £30-50/m².</p> <p>Concrete storage tank £449-518/m³.</p>	Section 10.4

SITE 30 : Purley Leisure Centre, car park and former Sainsbury's Supermarket, High Street

1) PROPOSED DEVELOPMENT

Site ID	30
Site Address	Purley Leisure Centre, car park and former Sainsbury's Supermarket, High Street
Site Area	0.66 ha
Current Use	Swimming pool, multi-storey car park and former supermarket
Allocated Use	Mixed use redevelopment incorporating new leisure facilities and/or other community facilities, healthcare facility, creative and cultural industries enterprise centre, retail, residential accommodation and public car park
Vulnerability	More Vulnerable

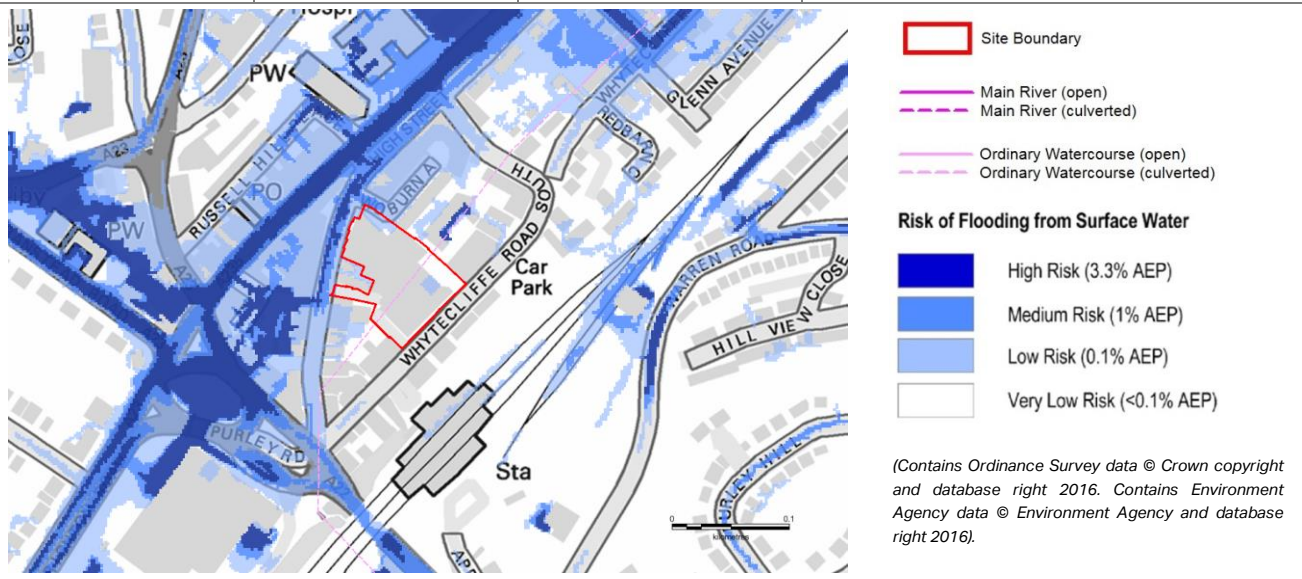
2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located within Flood Zone 1, low probability of flooding from rivers. However the culverted River Wandle, which is incorporated in to the surface water sewer system, is located below ground underneath the site. An ordinary watercourse is located approximately 1.4 km south east of the site.

It should be noted that ordinary watercourses have not have been included in the fluvial modelling of the River Wandle and therefore a fluvial flood risk from this watercourse may be present. As set out in Section 11.3.2 of the Level 1 SFRA, applicants considering development of this site may need to prepare a simple hydraulic model to enable a more accurate assessment of the probability of flooding associated with this ordinary watercourse to inform the site specific FRA. This should be carried out in line with industry standards and in agreement with the LLFA.

Flood risk from all other sources		Limitations	
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	Low Risk 1 in 1000 year (0.1% AEP)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	2	0	0	0	2 (TW External)

SITE 30 : Purley Leisure Centre, car park and former Sainsbury's Supermarket, High Street

3) RECOMMENDATIONS

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The following information and recommendations are therefore provided for consideration.

Development Layout and Sequential Approach	<p>The proposed development is for a mixed use, therefore the more vulnerable aspects (e.g. residential) should be located in areas at lowest flood risk. An assessment of surface water flow paths should be made during the development of the site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level. Further ground investigations would be required at this site to confirm the the likelihood of groundwater occurrence.</p>	Section 9.2
Flood Resistance	<p>Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.</p>	Section 9.4
Flood Resilience	<p>Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.</p>	Section 9.5
Flow Routing	<p>Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.</p>	Section 9.12
Surface Water Management	<p>Current risk of flooding</p> <p>The site is located within Critical Drainage Area (CDA) Group8_041, which is an area with localised flooding issues. The potential development must not increase flood risk to other areas in the CDA. The site is within Drainage Catchment 39, located at the southwestern part of the borough.</p> <p>The uFMfSW indicates that the site is at low risk of surface water flooding. The area adjacent to the northwest of the site is identified as at high risk of surface water flooding. There are two historic records of surface water flooding held by Croydon Council in this location.</p>	
	<p>Indicative existing runoff rate: 3.7 l/s (1 in 1 year), 14.0 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5.0 l/s</p>	Level 2 Appendix B
	<p>SuDS Suitability</p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially suitable. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p>Groundwater Source Protection Zones (SPZs)</p> <p>The site is within a SPZ1 (inner protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, the Environment Agency require a risk assessment to demonstrate that the SuDS scheme will not pose an unacceptable risk to the drinking water abstraction.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Techniques which should be considered including soakaways and infiltration SUDS supplemented by green roofs, filter strips, detention basins and ponds, as well as permeable surfacing. Infiltration rates should be confirmed on site prior to confirming the drainage strategy.</p>	Section 10.3 and 10.9

SITE 30 : Purley Leisure Centre, car park and former Sainsbury's Supermarket, High Street

	<p>Drainage Strategy and Approvals</p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p>Indicative Unit Costs</p> <p>Green roofs ~ £90/m².</p> <p>Filter strips £2-4m².</p> <p>Detention basin £15-50m³.</p> <p>Permeable paving ~ £30-50/m².</p> <p>Concrete storage tank £449-518/m³.</p>	Section 10.4

SITE 31 : Croydon College car park, College Road

1) PROPOSED DEVELOPMENT

Site ID	31
Site Address	Croydon College car park, College Road
Site Area	0.14 ha
Current Use	Eastern end of Croydon College over existing car park and access area
Allocated Use	Mixed use redevelopment comprising hotel & residential
Vulnerability	More Vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

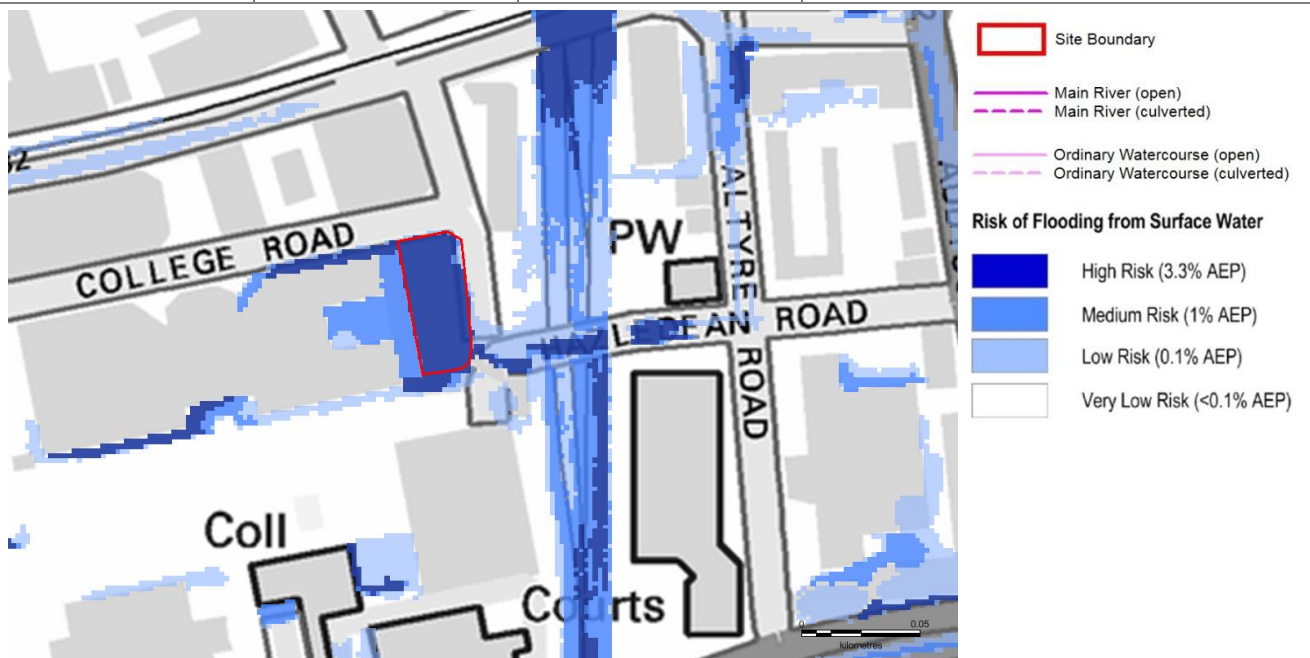
Flood risk from rivers

The site is located approximately 1km east of River Wandle and is located in Flood Zone 1, low probability of flooding from rivers.

Flood risk from all other sources

Limitations

<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	High Risk 1 in 30 year (3.3% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur below surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



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Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	1 (TW Internal)

SITE 31 : Croydon College car park, College Road

3) RECOMMENDATIONS

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The following information and recommendations are therefore provided for consideration.

Development Layout and Sequential Approach	<p>The uFmfSW shows that site and surrounding area may be at high risk of surface water flooding. An assessment of the local topography and surface water flow paths should be made during the development of the site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur below surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level. Further ground investigations would be required at this site to confirm the the likelihood of groundwater occurrence.</p>	Section 9.2
Finished Floor Level	<p>Although the majority of the site is within Flood Zone 1, it is good practice to set finished floor levels a minimum of 300mm above ground level in order to reduce the risk of flooding from surface water, which is at high risk in this area. It is recommended that consideration is given to the flow of surface water during the development of the site masterplan and layout to ensure effective management of surface water flows.</p>	
Flood Resistance	<p>Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.</p>	Section 9.4
Flood Resilience	<p>Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.</p>	Section 9.5
Flow Routing	<p>Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.</p>	Section 9.12
Surface Water Management	<p>Current risk of flooding</p> <p>The site is within Drainage Catchment 39, which is located at the southwestern part of the borough. The potential development must not increase flood risk to other areas in the Drainage Catchment.</p> <p>The uFMfSW indicates that the whole site is at high risk of surface water flooding. The uFMfSW identifies a pathway of high risk of surface water flooding east of the site.</p> <p>Indicative existing runoff rate: 0.7 l/s (1 in 1 year), 2.7 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5.0 l/s</p> <p>SuDS Suitability</p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that infiltration of surface water into the ground is potentially uncertain and requires further investigation prior to the development of a Drainage Strategy for the site.</p> <p>Groundwater Source Protection Zones (SPZs)</p> <p>The site is within a SPZ1 (inner protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, the Environment Agency require a risk assessment to demonstrate that the SuDS scheme will not pose an unacceptable risk to the drinking water abstraction.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer. Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems.</p>	<p>Level 2 Appendix B</p> <p>Section 10.3 and 10.9</p>

SITE 31 : Croydon College car park, College Road

	<p>Drainage Strategy and Approvals</p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p>Indicative Unit Costs</p> <p>Green roofs ~ £90/m².</p> <p>Filter strips £2-4m².</p> <p>Detention basin £15-50m³.</p> <p>Permeable paving ~ £30-50/m².</p> <p>Concrete storage tank £449-518/m³.</p>	Section 10.4

SITE 35: Purley Baptist Church, 2-12 Banstead Road

1) PROPOSED DEVELOPMENT

Site ID	35
Site Address	Purley Baptist Church, 2-12 Banstead Road
Site Area	0.43 ha
Current Use	Purley Baptist Church, parking area and other various buildings
Allocated Use	Mixed use redevelopment comprising new church, community facility and residential
Vulnerability	More Vulnerable

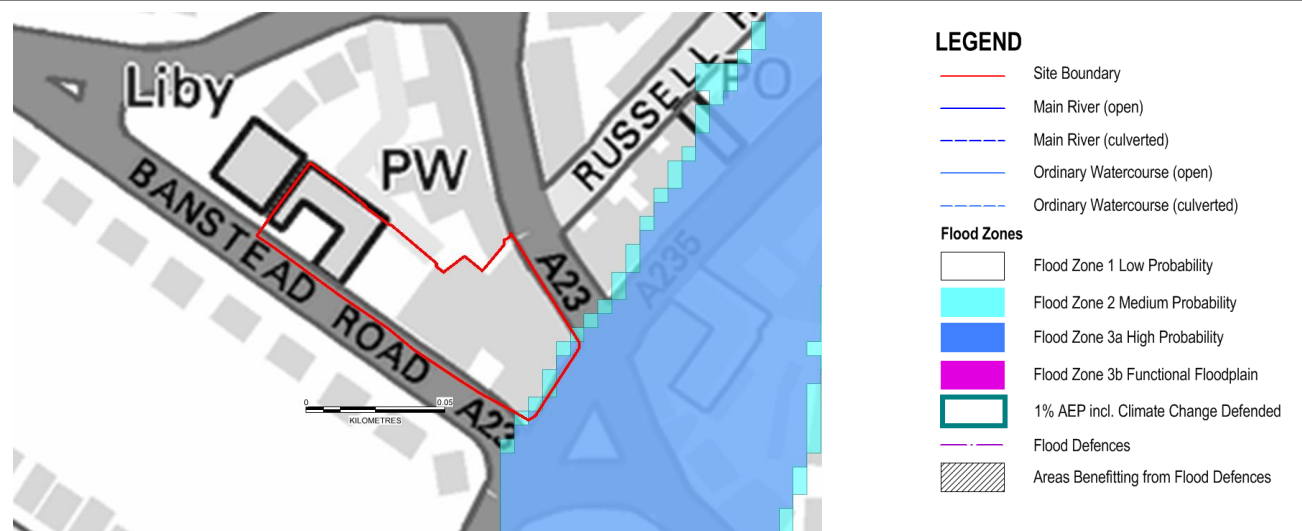
2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The south east site boundary is located adjacent to Flood Zone 3a of the culverted Caterham Bourne / River Wandle. There is a small section of open Caterham Bourne watercourse approximately 150m southeast of the site. At this location, the culverted River Wandle has been incorporated into the surface water sewer system as it flows north below the A235 Brighton Road.

The Environment Agency hydraulic model of the River Wandle prepared in 2015, does not extend upstream to include the culverted section of the River Wandle beneath the Brighton Road. As a result, flood depth and hazard information are not available from the revised modelling for the area adjacent to the site.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0%	1%	2%	97%	0%



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Flood risk from all other sources			Limitations
Risk of flooding to the potential development site and surrounding area	Surface Water flooding: (uFMfSW)	High Risk 1 in 30 year (3.33% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	3	0	0	0	2 (TW External)

SITE 35: Purley Baptist Church, 2-12 Banstead Road

3) LEVEL 2 ASSESSMENT

The fluvial hazard, depth and velocity outputs used in the Level 2 SFRA assessment for the River Wandle do not cover the site.

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	<p>The majority of the site lies within Flood Zone 1 and only a minor part at the south-east of the site is within Flood Zones 2 and 3a. Therefore, More Vulnerable developments should be preferably situated in Flood Zone 1. If it is essential to build on FloodZones 2 or 3a, then all residential uses should be located in the first floor level or above.</p> <p>The uFMfSW shows that site and surrounding area may be at high risk of surface water flooding. An assessment of the local topography and surface water flow paths should be made during the development of the site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). The groundwater fed Caterham Bourne main river is located approximately 150m southeast of the site, which floods due to high groundwater levels. There is a historic record of groundwater flooding 300m south of the site. Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level.</p>	Section 9.2
Finished Floor Levels	<p>Although the majority of the site is within Flood Zone 1, it is good practice to set finished floor levels a minimum of 300mm above ground level in order to reduce the risk of flooding from surface water, which is at high risk in this area. It is recommended that consideration is given to the flow or surface water during the development of the site masterplan and layout to ensure effective management of surface water flows.</p>	Section 9.3
Flood Resistance	<p>Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.</p>	Section 9.4
Flood Resilience	<p>Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.</p>	Section 9.5
Safe Access/Egress	<p>Access to the site is provided via Banstead Road (A223) to the north-west of the site.</p>	Section 9.7
Flow Routing	<p>Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.</p>	Section 9.12
Flood Warning and Evacuation Plan	<p>A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles.</p> <p>Flood Warning Areas</p> <p>The local area is not covered by the Environment Agency Flood Warning Areas for 'Groundwater Flooding in the Caterham Bourne Catchment'.</p> <p>Emergency Rest Centres</p> <p>The closest designated emergency rest centre for this site is the Kenley Memorial Hall, at 92 Godstone Road, approximately 1.9km south-east of the proposed site.</p>	Section 9.14
Surface Water Management	<p>Current risk of flooding</p> <p>The site lies within Critical Drainage Area (CDA_Group8_040), which is an area with localised flooding issues. The potential development must not increase flood risk to areas within the CDA. The site is within Drainage Catchment 47, located at the south-western part of the borough.</p> <p>The uFMfSW indicates that the majority of the site and surrounding area is at high risk of surface water flooding. There are three historic records of surface water flooding held by Croydon Council in this location.</p>	

SITE 35: Purley Baptist Church, 2-12 Banstead Road

	<p>Indicative existing runoff rate: 2.4 l/s (1 in 1 year), 9.1 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5.0 l/s</p>	Section 10
	<p>SuDS Suitability Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially suitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p>Groundwater Source Protection Zones The site is within a SPZ1 (inner protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, the Environment Agency require a risk assessment to demonstrate that the SuDS scheme will not pose an unacceptable risk to the drinking water abstraction.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Techniques which should be considered on this site include soakaways and infiltration SUDS supplemented by green roofs, filter strips, detention basins and ponds, as well as permeable surfacing. Infiltration rates should be confirmed on site prior to confirming the drainage strategy.</p>	Section 10.3 and 10.9
	<p>Drainage Strategy and Approvals Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p>Indicative Unit Costs Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.</p>	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

This development site is at high risk of surface water flooding and potential risk of groundwater flooding. For this development site, the most vulnerable development (school buildings and residential) should be located in areas of low surface water flood risk. More Vulnerable residential development should consider raising finished floor levels and/or locating all sleeping accommodation at first floor level or above. It is recommended that basements are not considered at this site.

SuDS should be incorporated into the building design in order to reduce the risk of increasing flood risk elsewhere. There is potential that floodwaters will limit dry routes out of the local area, therefore it is necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 48 : 294-330 Purley Way

1) PROPOSED DEVELOPMENT

Site ID	48
Site Address	294-330 Purley Way
Site Area	2.63 ha
Current Use	Retail warehouse and vacant employment land
Allocated Use	Mixed use development comprising retail store, commercial space and residential units
Vulnerability	More Vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

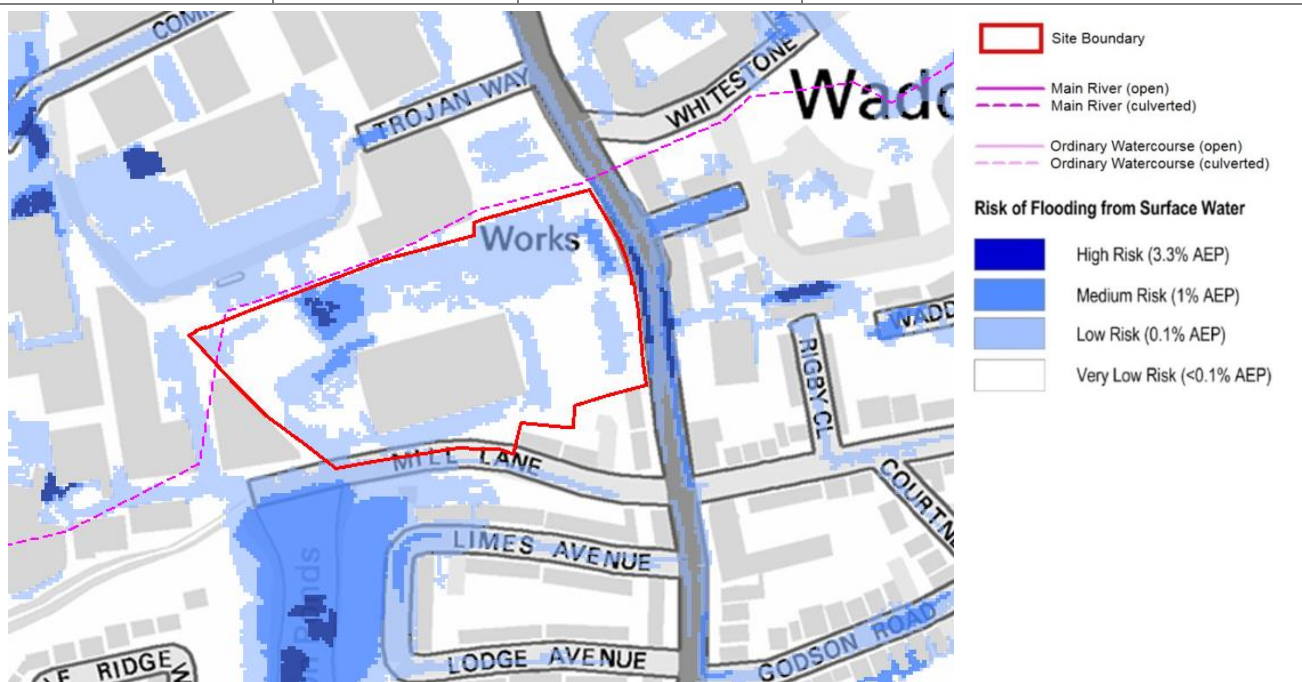
Flood risk from rivers

The culverted River Wandle runs along the northern boundary of the site. However, as the main river is within culvert at this point, the site is located in Flood Zone 1.

Flood risk from all other sources

Limitations

<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	High Risk 1 in 30 year (3.3 % annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	



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Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

SITE 48 : 294-330 Purley Way**3) RECOMMENDATIONS**

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of surface water flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The following information and recommendations are therefore provided for consideration.

Development Layout and Sequential Approach	An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible. Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level. Further ground investigations would be required at this site to confirm the the likelihood of groundwater occurrence.	Section 9.2
Flood Resistance	Where there may be a future risk of surface water flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage surface water and fluvial floodwater.	Section 9.4
Flood Resilience	Where parts of proposed buildings may be affected by surface water floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures. The use of concrete flooring and waterproof building materials could be considered.	Section 9.5
Flow Routing	Potential overland flow paths should be determined and appropriate solutions proposed to minimise the impact of the development, for example by configuring road and building layouts to preserve existing flow paths and improve flood routing, whilst ensuring that flows are not diverted towards other properties elsewhere.	Section 9.12
Surface Water Management	Current risk of flooding The site is within Drainage Catchment 37, which is located at the western part of the borough. The potential development must not increase flood risk to areas within the Drainage Catchment. The uFMfSW indicates that the site lies within an area of high risk of surface water flooding, particularly at its northern part, and the surrounding areas are at high to medium risk of surface water flooding.	
	Indicative existing runoff rate: 13.6 l/s (1 in 1 year), 50.9 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5.3 l/s	Level 2 Appendix B
	SuDS Suitability Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially suitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site. Techniques which should be considered including soakaways and infiltration SUDS supplemented by green roofs, filter strips, detention basins and ponds, as well as permeable surfacing. Infiltration rates should be confirmed on site prior to confirming the drainage strategy.	Section 10.3 and 10.9
	Drainage Strategy and Approvals Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies. Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided. Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy. There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.	Section 10.6

SITE 48 : 294-330 Purley Way

	Indicative Unit Costs Green roofs ~ £90/m ² . Filter strips £2-4m ² . Detention basin £15-50m ³ . Permeable paving ~ £30-50/m ² . Concrete storage tank £449-518/m ³ .	Section 10.4
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SITE 54: BMW House, 375-401 Brighton Road

1) PROPOSED DEVELOPMENT

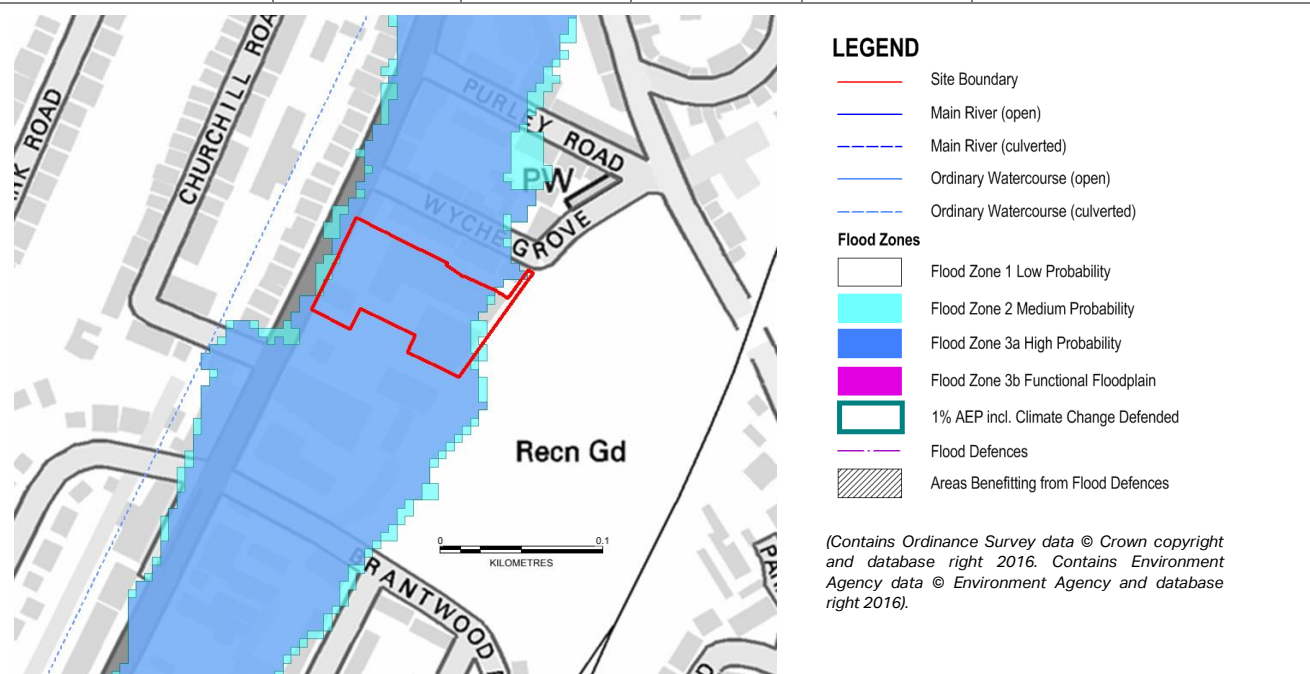
Site ID	54
Site Address	BMW House, 375-401 Brighton Road
Site Area	0.58 ha
Current Use	Site of former BMW showroom which has a multistorey car park to the rear of site
Allocated Use	Mixed use residential and supermarket
Vulnerability	More Vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located in Flood Zone 3a associated with the culverted River Wandle. At this location, the culverted River Wandle has been incorporated into the surface water sewer system as it flows north below the A235 Brighton Road.

Proportion of potential development site within Flood Zone	Flood Zone 3b	Flood Zone 3a	Flood Zone 2	Flood Zone 1	Area Benefiting of Defences
	0%	91%	4%	5%	0%



Flood risk from all other sources | **Limitations**

<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	High Risk 1 in 30 year (3.33% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system. The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur at surface, but no historic records of groundwater flooding	

Historic records of flooding

Historic records of flooding from each source within a 100m radius of potential development site	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	0	0	0	0

SITE 54: BMW House, 375-401 Brighton Road

3) LEVEL 2 ASSESSMENT

The Environment Agency hydraulic model of the River Wandle prepared in 2015, does not extend upstream to include the culverted section of the River Wandle beneath the Brighton Road. As a result, flood depth and hazard information are not available from the revised modelling for the area adjacent to the site.

4) RECOMMENDATIONS AND POLICIES

Development Layout and Sequential Approach	<p>The majority of the site lies within Flood Zone 3a and only a minor part at the east of the site is within Flood Zones 1 and 2. If it is essential to build on FloodZones 2 or 3a, then all residential uses should be located in the first floor level or above.</p> <p>The uFMfSW shows that site and surrounding area may be at high risk of surface water flooding. An assessment of the local topography and surface water flow paths should be made during the development of the site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level. Further ground investigations would be required at this site to confirm the the likelihood of groundwater occurrence.</p>	Section 9.2
Finished Floor Levels	<p>For More Vulnerable development, a minimum freeboard of 300mm is required above the 1% AEP (1 in 100 year) including climate change peak fluvial flood level. The peak flood water level should be derived for the immediate vicinity of the site as part of a site-specific FRA.</p> <p>The site is at high risk of surface water flooding. It is considered that the finished floor level requirement for fluvial flood levels would also protect the property from a 0.33% AEP (1 in 30 year) surface water flood event.</p>	Section 9.3
Flood Resistance	<p>It is recommended that flood resistant construction methods should be considered, including use of construction materials with low permeability, raising property thresholds, using landscaping to manage surface water and fluvial floodwater.</p>	Section 9.4
Safe Access/Egress	<p>Access to the site is provided via Churchill Road to the west of the site.</p>	Section 9.7
Flow Routing	<p>Any new development in Flood Zones 2 and 3 should not adversely affect flood routing and thereby increase flood risk elsewhere. Within these areas opportunities should be sought within the site design to make space for water, such as:</p> <ul style="list-style-type: none"> • Removing boundary walls or replacing with other boundary treatments such as hedges, fences (with gaps). • Considering alternatives to solid wooden gates, or ensuring that there is a gap beneath the gates to allow the passage of floodwater. 	Section 9.12
Flood Warning and Evacuation Plan	<p>A Flood Warning and Evacuation Plan (FWEP) must be prepared for the site, detailing how flood warning will be provided how the safety of occupants and access to/from the development will be ensured and what will be done to protect development and contents. The FWEP should consider arrangements for the evacuation of basement car parks. Where possible, the FWEP should also detail the length of time before the site becomes inaccessible by emergency vehicles.</p> <p>Flood Warning Areas</p> <p>The local area is not covered by the Environment Agency Flood Warning Areas for 'Groundwater flooding for the Caterham Bourne catchment'.</p> <p>Emergency Rest Centres</p> <p>The closest designated emergency rest centre for this site is the 'United Reformed Church' at Sanderstead Hill, located approximately 1.4km south-east .of the development site.</p>	Section 9.14
Surface Water Management	<p>Current risk of flooding</p> <p>The site lies within Critical Drainage Area (CDA) Group8_042, which is an area with localised flooding issues. The potential development must not increase flood risk to areas within the CDA. The site is within Drainage Catchment 39, which is located in the western part of the borough. The uFMfSW indicates that the majority of the site and surrounding area is at high risk of surface water flooding.</p>	
	<p>Indicative existing runoff rate: 3.1 l/s (1 in 1 year), 11.8 l/s (1 in 100 year)</p> <p>Indicative Greenfield Runoff Rate: 5.0 l/s</p>	Section 10

SITE 54: BMW House, 375-401 Brighton Road

	<p>SuDS Suitability</p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that (prior to the completion of a site investigation to determine precise local conditions) infiltration of surface water into the ground is potentially suitable for the site. Site investigations will be required prior to the development of a Drainage Strategy for the site.</p> <p>Groundwater Source Protection Zones (SPZs)</p> <p>The site is within a SPZ1 (inner protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, the Environment Agency require a risk assessment to demonstrate that the SuDS scheme will not pose an unacceptable risk to the drinking water abstraction.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Techniques which should be considered including soakaways and infiltration SUDS supplemented by green roofs, filter strips, detention basins and ponds, as well as permeable surfacing. Infiltration rates should be confirmed on site prior to confirming the drainage strategy.</p>	Section 10.3 and 10.9
	<p>Drainage Strategy and Approvals</p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p>Indicative Unit Costs</p> <p>Green roofs ~ £90/m². Permeable paving ~ £30-50/m². Filter strips £2-4m². Detention basin £15-50m³. Concrete storage tank £449-518/m³.</p>	Section 10.4

5) EXCEPTION TEST CONSIDERATIONS

The NPPF states that there are two parts to the Exception Test that must be passed for development to be allocated or permitted:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The proposed development is for mixed use, therefore the most vulnerable development (e.g. residential) should be located in areas of lowest fluvial and surface water flood risk. More Vulnerable residential development that must be located within Flood Zone 3a should consider raising finished floor levels and/or locating all sleeping accommodation at first floor level or above. It is recommended that basements are not considered at this site.

To ensure occupants/residents evacuate the site safely in the event of a flood it is necessary to prepare a FWEP for residents / occupants of the site detailing steps to evacuate the site prior to the onset of flooding. SuDS should be incorporated into the building design in order to reduce the risk of increasing flood risk elsewhere. Therefore, on this basis, it is likely that this site would pass the Exception Test.

SITE 115 : Cheriton House, 20 Chipstead Avenue

1) PROPOSED DEVELOPMENT

Site ID	115
Site Address	Cheriton House, 20 Chipstead Avenue
Site Area	0.17 ha
Current Use	Former care home and land
Allocated Use	Residential redevelopment
Vulnerability	More Vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The site is located approximately 250m west of Norbury Brook and is located within Flood Zone 1, low probability of flooding from rivers.

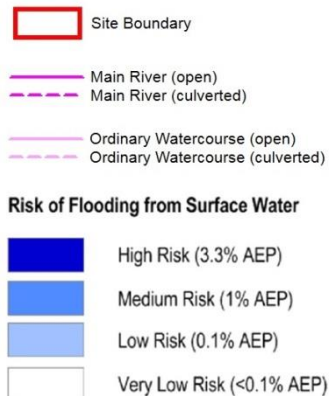
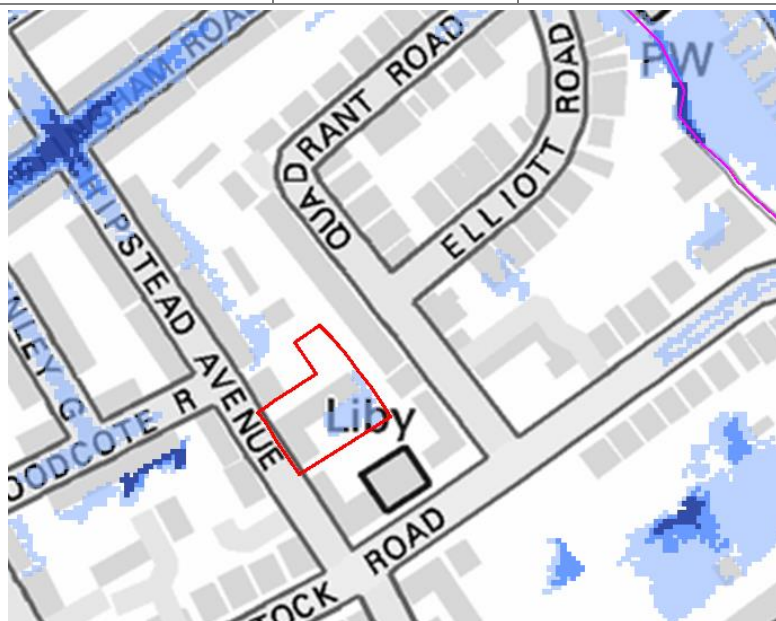
Flood risk from all other sources

<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	Low Risk 1 in 1000 year (0.1%% annual probability)
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	High Risk Potential for groundwater flooding to occur at surface and historic records of groundwater flooding

Limitations

The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system.

The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.



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Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	0	3	0	0	0

SITE 115 : Cheriton House, 20 Chipstead Avenue

3) RECOMMENDATIONS

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. However, given the risk of groundwater flooding to this site, the principles of the Exception Test should still be considered when developing on this site, namely:

- 1) *"it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk"* and
- 2) *"demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall"*.

The following information and recommendations are therefore provided for consideration.

Development Layout and Sequential Approach	<p>There are three historic records of groundwater flooding held by Croydon Council within 100m of this site. Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Due to a high risk of groundwater flooding, it is recommended that Low Vulnerable basements are also not permitted at this site.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p>	Section 9.2
Flood Resistance	<p>Where there may be a future risk of groundwater flooding on the site, flood resistant construction measures may be employed, such as raising property thresholds, and the use of landscaping to manage groundwater floodwater.</p>	Section 9.4
Flood Resilience	<p>Where parts of proposed buildings may be affected by groundwater floodwaters, e.g. undercroft parking areas, flood resilient design techniques should be employed to minimise damage to buildings and structures.</p>	Section 9.5
Surface Water Management	<p>Current risk of flooding</p> <p>The site falls within the Critical Drainage Catchment (CDA) Group 8_049, which is an area with localised flooding issues. The potential development must not increase flood risk to areas within the CDA. The site is within Drainage Catchment 22, which is located at the north part of the borough.</p> <p>The uFMfSW indicates that the site lies within an area of low risk of surface water flooding, particularly at its eastern part, and the surrounding areas are located within areas of high to medium risk of surface water flooding.</p> <p>Indicative existing runoff rate: 0.8 l/s (1 in 1 year), 3.2 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5.0 l/s</p> <p>SuDS Suitability</p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that infiltration of surface water into the ground is potentially uncertain and requires further investigation prior to the development of a Drainage Strategy for the site.</p> <p>Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems.</p> <p>Drainage Strategy and Approvals</p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p> <p>Indicative Unit Costs</p> <p>Green roofs ~ £90/m². Filter strips £2-4m². Detention basin £15-50m³. Permeable paving ~ £30-50/m². Concrete storage tank £449-518/m³.</p>	<p>Level 2 Appendix B</p> <p>Section 10.3 and 10.9</p> <p>Section 10.6</p> <p>Section 10.4</p>

SITE 123 : Prospect West and car park to the rear of, 81-85 Station Road

1) PROPOSED DEVELOPMENT

Site ID	123
Site Address	Prospect West and car park to the rear of, 81-85 Station Road
Site Area	0.6 ha
Current Use	Car park at rear and office block
Allocated Use	Residential (with healthcare facility if required by NHS)
Vulnerability	More Vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

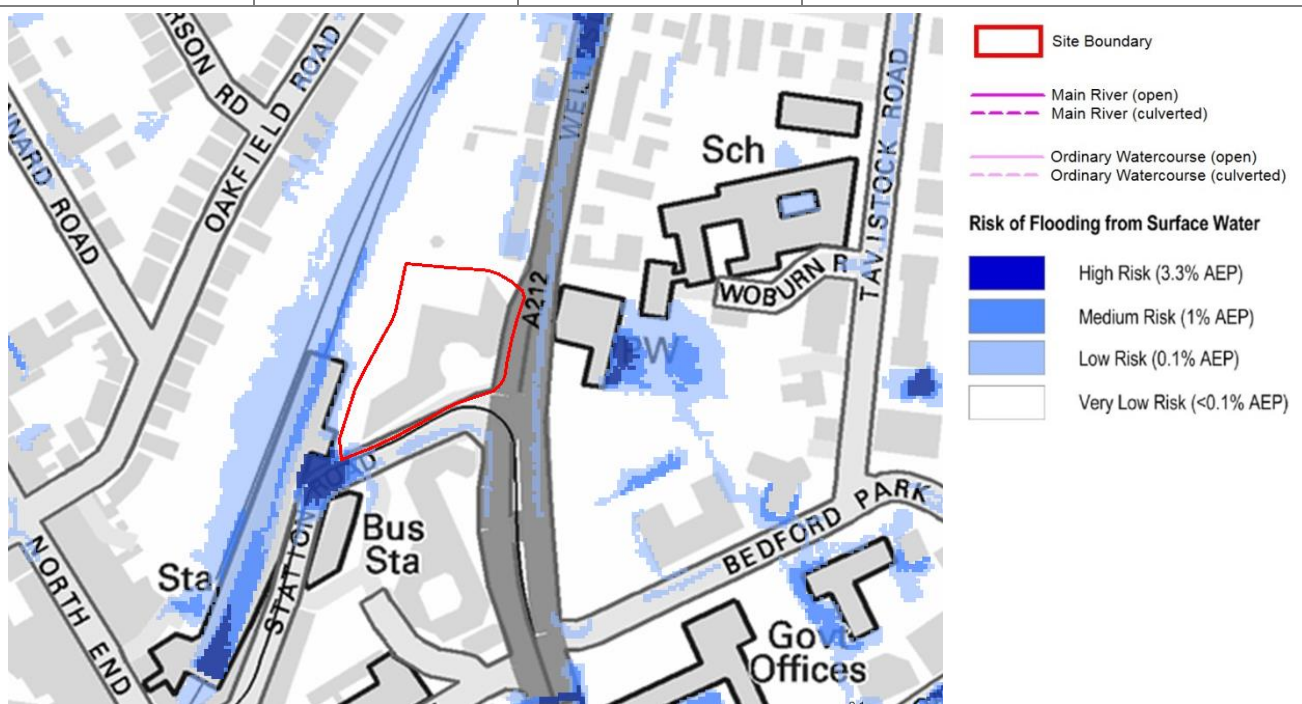
Flood risk from rivers

The River Wandle is located approximately 950m south-west of the site. The site is located in Flood Zone 1, low probability of flooding from rivers.

Flood risk from all other sources

Limitations

<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	Low Risk 1 in 1000 year (0.1% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system. The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur below surface, but no historic records of groundwater flooding	



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Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	1	0	0	0	1(TW Internal)

SITE 123 : Prospect West and car park to the rear of, 81-85 Station Road

3) RECOMMENDATIONS

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. The following information and recommendations are provided for consideration.

Development Layout and Sequential Approach	<p>An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. Most of the site is at low risk of surface water flooding with only the south western corner at high risk. Therefore access to the site from Statton Road should be away from this corner, and development focused in the lower risk areas of the site.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur at the surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level. Further ground investigations would be required at this site to confirm the the likelihood of groundwater occurrence.</p>	Section 9.2
Surface Water Management	<p>Current risk of flooding</p> <p>The site is within Drainage Catchment 38, which is located at the north-west part of the borough. The potential development must not increase flood risk to other areas in the Drainage Catchment.</p> <p>The uFMfSW indicates that the site lies within an area of low risk of surface water flooding, with a small area of high risk at its south part. The area adjacently south of the site is also modelled as a high risk area. There is one historic record of surface water flooding held by Croydon Council in this location.</p> <p>Indicative existing runoff rate: 3.1 l/s (1 in 1 year), 11.5 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5.0 l/s</p> <p>SuDS Suitability</p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that infiltration of surface water into the ground is potentially uncertain and requires further investigation prior to the development of a Drainage Strategy for the site.</p> <p>Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems.</p> <p>Drainage Strategy and Approvals</p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p> <p>Indicative Unit Costs</p> <p>Green roofs ~ £90/m². Filter strips £2-4/m². Detention basin £15-50/m³. Permeable paving ~ £30-50/m². Concrete storage tank £449-518/m³.</p>	<p>Level 2 Appendix B</p> <p>Section 10.3 and 10.9</p> <p>Section 10.6</p> <p>Section 10.4</p>

SITE 162 : St George's House, Park Lane

1) PROPOSED DEVELOPMENT

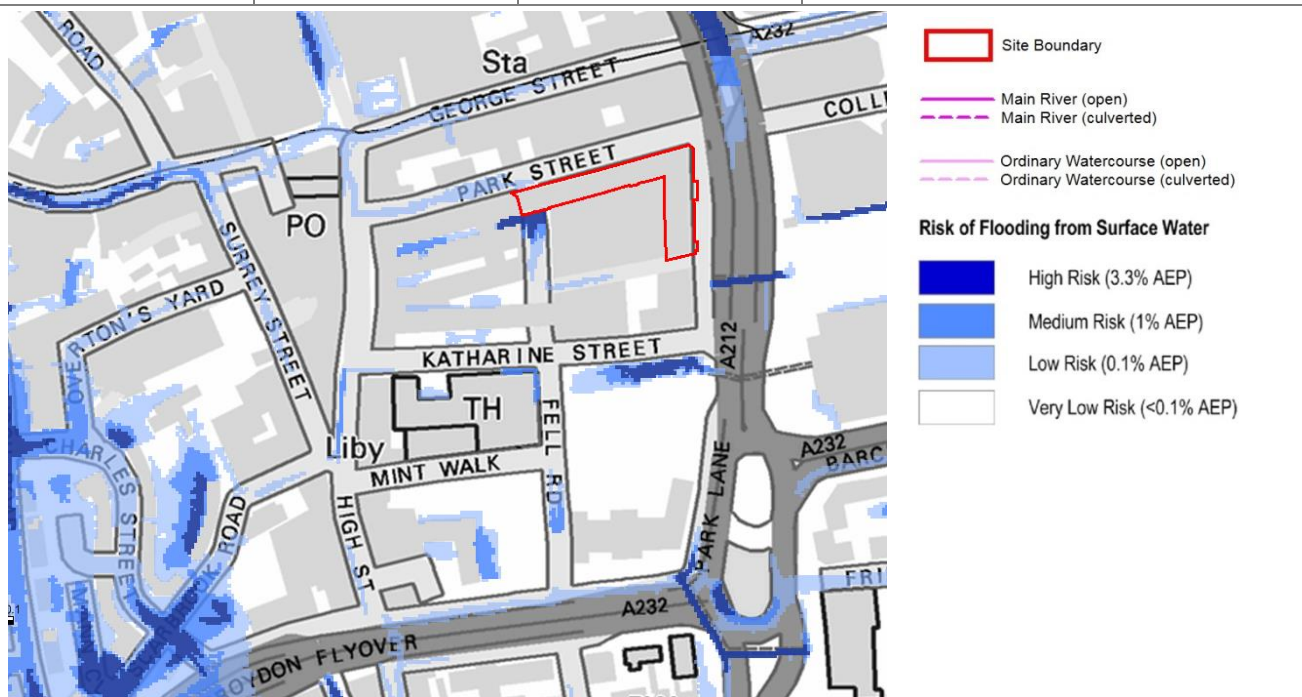
Site ID	162
Site Address	St George's House, Park Lane
Site Area	0.3 ha
Current Use	Office Building
Allocated Use	Conversion and extension of existing building to provide retail and other Class A activities (such as food and drink) on the ground floor with residential accommodation on upper floors
Vulnerability	More Vulnerable

2) SUMMARY OF LEVEL 1 FLOOD RISK

Flood risk from rivers

The closest watercourse to the site is an ordinary watercourse located approximately 550 west of the site. The River Wandle is located approximately 1km north-west of the site. The site is located in Flood Zone 1, low probability of flooding from rivers.

Flood risk from all other sources		Limitations	
<i>Risk of flooding to the potential development site and surrounding area</i>	Surface Water flooding: (uFMfSW)	Low Risk 1 in 1000 year (0.1% annual probability)	The uFMfSW data does not show the susceptibility of individual properties to surface water flooding. The uFMfSW also does not take into account the details of the existing drainage system. The dataset cannot be used on its own to indicate risk of groundwater flooding and should not be used to inform planning decisions at a site scale. It is suitable for use in conjunction with a large number of other factors, e.g. records of previous incidence of groundwater flooding, to establish relative risk of groundwater flooding.
	Groundwater flooding: (BGS Susceptibility to Groundwater Flooding)	Medium Risk Potential for groundwater flooding to occur below surface, but no historic records of groundwater flooding	



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Historic records of flooding

<i>Historic records of flooding from each source within a 100m radius of potential development site</i>	Fluvial records	Surface water records	Groundwater records	Sewer records	Multiple source records	Other
	0	1	0	0	0	0

SITE 162 : St George's House, Park Lane

3) RECOMMENDATIONS

In accordance with the NPPF, More Vulnerable development is considered compatible within Flood Zone 1 and does not require the application of the Exception Test. The following information and recommendations are provided for consideration.

Development Layout and Sequential Approach	<p>An assessment of surface water flow paths should be made prior to site design, to encourage the location of buildings and more vulnerable aspects of the development away from those areas at risk of surface water ponding. Most of the site is identified as being at Low or Very Low risk of surface water flooding. The access point via Katherine street is at high risk so any access to the site should be via park street which is at low risk of surface water flooding.</p> <p>Measures to manage surface water on the site should be considered early in the site masterplan to enable inclusion of attenuation SuDS where possible.</p> <p>Self-contained residential basements and bedrooms at basement level are not permitted in areas that have 'potential for groundwater to occur below surface' (BGS Susceptibility to Groundwater Flooding). Less Vulnerable basements, basement extensions and conversions, such as car parking, must provide safe internal access to higher floors situated above ground level. Ground investigations would be required at this site to confirm the the likelihood of groundwater occurrence.</p>	Section 9.2
Surface Water Management	<p>Current risk of flooding</p> <p>The site falls within Critical Drainage Area (CDA) Group 8_042, which is an area with localised flooding issues. The potential development must not increase flood risk to areas within the CDA. The site is within Drainage Catchment 39, which is located at the south-west part of the borough. The uFMfSW indicates that the site lies within an area of low risk of surface water flooding, with a small area of high risk at its western part. There is one historic record of surface water flooding held by Croydon Council in this location.</p>	
	<p>Indicative existing runoff rate: 1.5 l/s (1 in 1 year), 5.7 l/s (1 in 100 year) Indicative Greenfield Runoff Rate: 5.0 l/s</p>	Level 2 Appendix B
	<p>SuDS Suitability</p> <p>Reference to the SWMP Appendix C2 Figure 5 identifies that infiltration of surface water into the ground is potentially uncertain and requires further investigation prior to the development of a Drainage Strategy for the site.</p> <p>Groundwater Source Protection Zones (SPZs)</p> <p>The site is within a SPZ1 (inner protection zone). Where infiltration SuDS are to be used for surface runoff from roads, car parking and public or amenity areas, they should have a suitable series of treatment steps to prevent the pollution of groundwater.</p> <p>Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, the Environment Agency require a risk assessment to demonstrate that the SuDS scheme will not pose an unacceptable risk to the drinking water abstraction.</p> <p>The design of infiltration SuDS schemes and their treatment stages needs to be appropriate to the sensitivity of the location and subject to a relevant risk assessment considering the types of pollutants likely to be discharged, design volumes and the dilution and attenuation properties of the aquifer.</p> <p>Techniques which should be considered include green roofs, filter strips, detention basins and ponds, as well as permeable surfacing in combination with tanked systems.</p>	Section 10.3 and 10.9
	<p>Drainage Strategy and Approvals</p> <p>Croydon Council will require a Drainage Strategy to be prepared outlining the surface water management for the site, runoff rates and consideration of SuDS in line with the London Plan policy 5.13 and Local Plan policies.</p> <p>Where it is not possible to achieve greenfield runoff rates in accordance with the preferred standards set out in the London Plan policy 5.13 and Design and Construction SPG (April 2014), then justification must be provided.</p> <p>Arrangements for the future maintenance of the drainage system must be made and detailed in the Drainage Strategy.</p> <p>There is no automatic right to connect to the existing Thames Water network. Any potential diversions and/or discharges into a sewer or main river must be agreed with Thames Water or Environment Agency, respectively.</p>	Section 10.6
	<p>Indicative Unit Costs</p> <p>Green roofs ~ £90/m². Filter strips £2-4/m². Detention basin £15-50/m³. Permeable paving ~ £30-50/m². Concrete storage tank £449-518/m³.</p>	Section 10.4